

**Science
Learning Outcomes
Grade 6**

Students will

Standard #

EARTH SCIENCE

- ES1** Recognize, interpret, and create models of the earth's common physical features in various mapping representations, including contour maps.
- ES2** Describe the layers of the solid earth including the lithosphere, the hot convecting mantle, and the dense metallic core.
- ES3** Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.
- ES4** Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.
- ES5** Describe how the movement of the earth's crustal plates causes both slow and rapid changes in the earth's surface.
- ES6** Describe and give examples of ways in which the earth's surface is built up and torn down by natural processes.
- ES7** Explain and give examples of how physical evidence, such as fossils and surface features of glaciation, supports theories that the earth has evolved over geological time.
- ES8** Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth.
- ES8** Recognize that gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions.
- ES9** Describe lunar and solar eclipses, the observed moon phases, and tides.
- ES 10** Compare and contrast properties and conditions of objects in the solar system to those on earth.
- ES 11** Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.
- ES 12** Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.

Describe the scientific method

Learning Outcomes
Grade 6 *Continued*

Students will

Standard #

EARTH SCIENCE *Continued*

Compare and contrast an experimental setup and a control setup.

Describe the big bang theory and relate it to the formation of the universe.

Describe the four main layers of the sun.

Describe the origin and characteristics of the moon.

Describe the physical and geological features of the ocean.

Describe the rock cycle.

Recognize several factors that affect weathering.

Identify the factors that combine to cause weather.

**Science
Learning Outcomes
Grade 7**

Students will

Standard #

LIFE SCIENCE

- LS1** Classify organisms into all kingdoms according to characteristics that they share.
- LS2** Recognize that all organisms are composed of cells, and that most organisms are single celled. In these single-celled organisms, one cell must carry out all of the basic functions of life.
- LS3** Compare and contrast plant and animal cells.
- LS4** Recognize that within cells, many of the basic functions of organisms are carried out.
- LS5** Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.
- LS7** Recognize that every organism requires a set of instructions for specifying its traits, and that heredity is the passage of these instructions from one generation to another.
- LS8** Recognize that hereditary information is contained in genes located in the chromosomes of each cell.
- LS9** Differentiate between sexual reproduction and asexual reproduction.
- LS10** Give examples of ways in which genetic variation and environmental factors are causes of evolution and of the diversity of organisms.
- LS11** Recognize that evidence drawn from geology, fossils, and comparative anatomy provides the basis of the theory of evolution.
- LS12** Relate the extinction of species to a mismatch of adaptation and the environment.
- LS13** Give examples of ways in which organisms interact and have different functions within an ecosystem that enable the ecosystem to survive.
- LS14** Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.
- LS15** Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.
- LS16** Recognize that producers use the energy from sunlight to make sugars from carbon

dioxide and water through a process called photosynthesis.

Learning Outcomes
Grade 7 *Continued*

Students will

Standard #

LIFE SCIENCE *Continued*

LS17 Identify ways in which ecosystems have changed throughout geologic time in response to physical conditions, interactions among organisms, and the actions of humans.

LS17 Describe how changes, such as volcanic eruptions or ice storms, may be catastrophes.

LS18 Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.

Describe the structure of a typical flower.

Describe the process and importance of photosynthesis.

Compare vertebrates and invertebrates.

Describe the main characteristics of mammals.

Describe how food is digested throughout the body.

Explain how biotic and abiotic factors cycle in an ecosystem (water, carbon dioxide, oxygen and nitrogen).

Use a food web to identify and distinguish producers, consumers, and decomposers.

Describe the transfer of energy in an ecosystem.

Identify the factors in an ecosystem that influence fluctuations in populations.

Identify how symbiotic relationships cause interactions within an ecosystem.

**Science
Learning Outcomes
Grade 8**

Students will

Standard #

PHYSICAL SCIENCE

- PS1** Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.
- PS2** Differentiate between volume and mass.
- PS3** Recognize that the measurement of volume and mass requires an understanding of the sensitivity of measurement tools and knowledge and appropriate use of significant digits.
- PS3** Calculate the volume of water.
- PS4** Observe the mass of several systems before and after a reaction has taken place.
- PS4** Explain and give examples of how mass is conserved in a closed system.
- PS5** Recognize that there are more than 100 elements that combine in a multitude of ways to produce compounds that make up all of the living and nonliving things we encounter.
- PS6** Differentiate between an atom (the smallest unit of an element that maintains the characteristics of that element) and a molecule (the smallest unit of a substance that maintains the characteristics of that substance).
- PS7** Give basic examples of elements and compounds.
- PS8** Differentiate between mixtures and pure substances.
- PS9** Recognize that a substance (element or compound) has a melting point and a boiling point, both of which are independent of the amount of the sample.
- PS10** Differentiate between physical changes and chemical changes.
- PS11** Explain and give examples of how the motion of an object can be described by its position, direction of motion, and speed.
- PS12** Graph and interpret distance vs. time graphs for constant speed.
- PS13** Differentiate between potential and kinetic energy. Identify situations where kinetic

energy is transformed into potential energy and vice versa.

Learning Outcomes **Grade 8 *Continued***

Students will

Standard #

PHYSICAL SCIENCE *Continued*

- PS14** Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.
- PS15** Explain the effect of heat on particle motion through a description of what happens to particles during a change in phase.
- Explain the importance of following safety rules in the laboratory.
- Describe the gas laws.
- Distinguish between chemical and physical properties.
- Describe energy changes in terms of endothermic and exothermic reactions.
- Describe the properties and uses of acids and bases.